FAA AVIATION NEWS

JULY 1967

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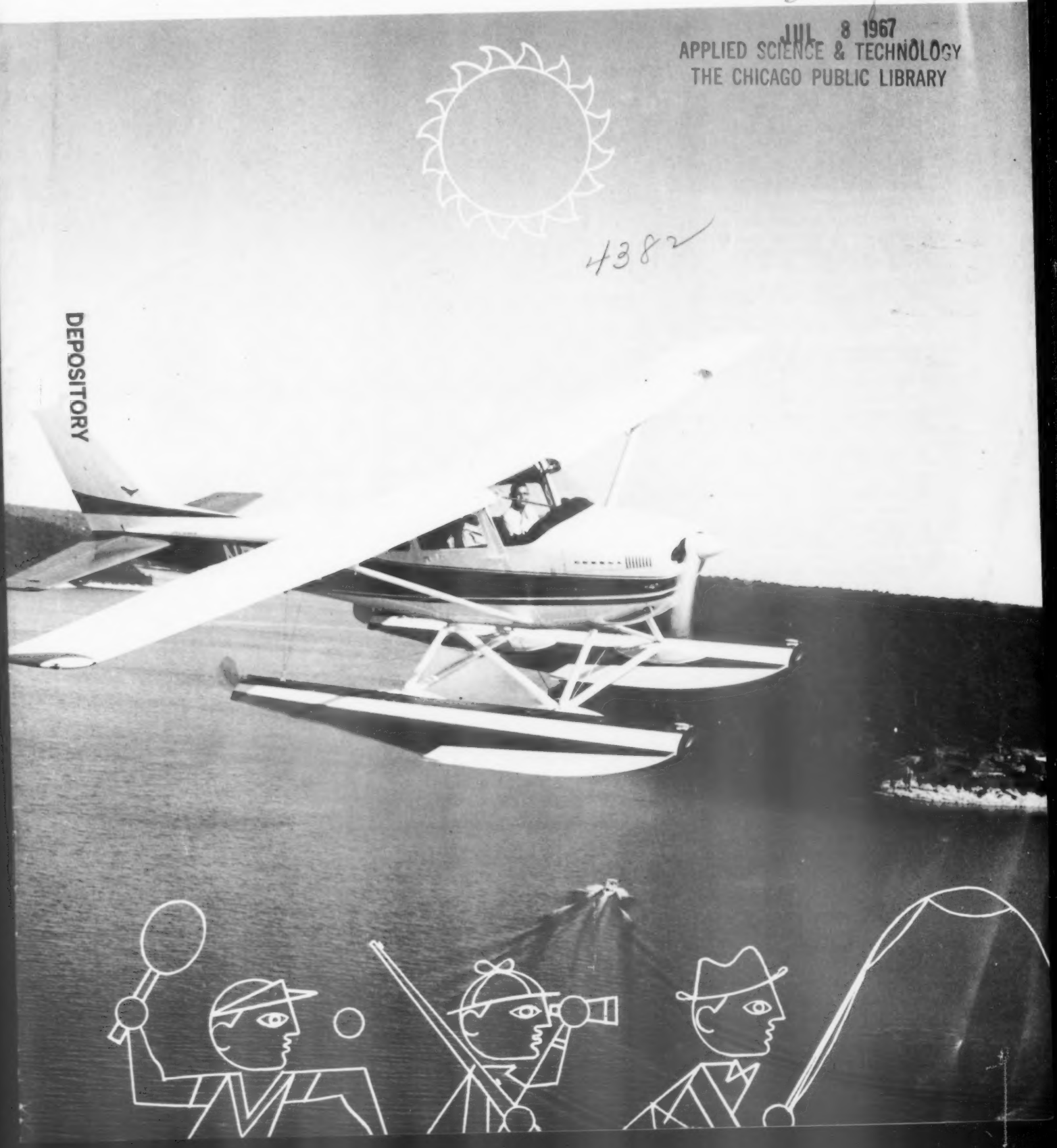

COVER

Summertime is vacation flying time.
For some medical tips on how
to keep the doctor away,
see "Summer Flying," page 6.

FAA AVIATION NEWS

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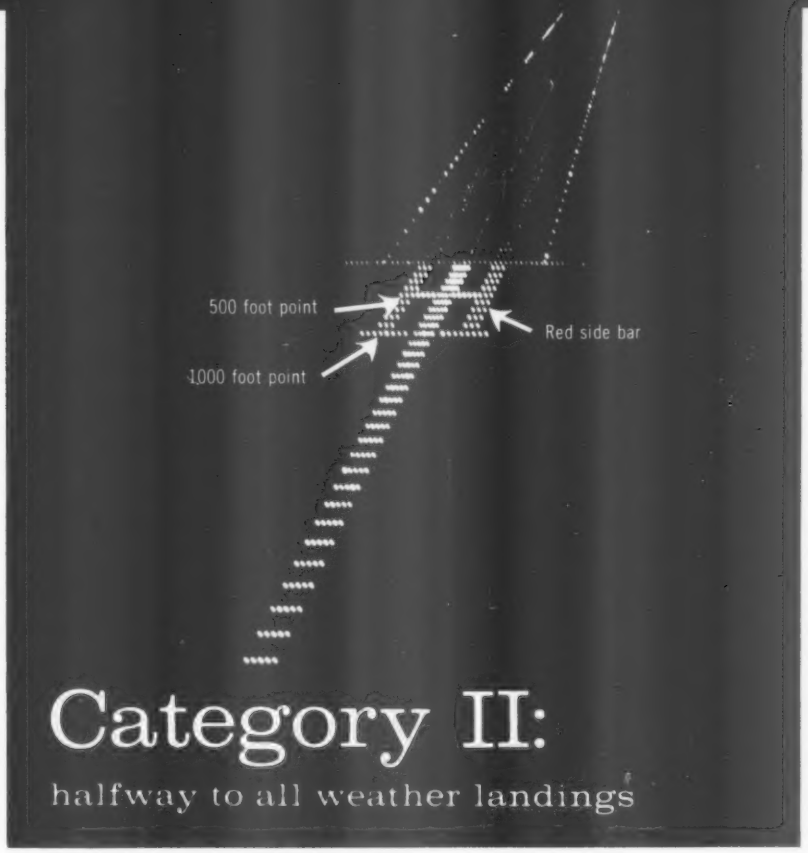


Category II:

halfway to all weather landings

Significant Category II additions are red side bars for last 1,000 feet of approach and continuous bar of white lights at 500 foot point. Photo shows runway at Dulles International Airport.

New FAA regulations that will permit general aviation pilots to land properly equipped airplanes with as little as 1,200 feet of forward visibility from a "decision height" of 100 feet, will go into effect August 7, 1967.

The lower Category II minimums are a step towards the goal of making landings possible in all types of weather.

Current weather minimums (Category I) for instrument-rated general aviation pilots are one-half mile horizontal visibility and a 200-foot ceiling or decision height (the altitude at which the pilot must decide whether to attempt a landing or discontinue his approach to the runway).

Authorization for general aviation pilots to land under Category II weather conditions will be limited for the first six months to an interim step of 1,600 feet horizontal RVR (runway visual range) visibility and a 150-foot decision height. This limitation will be removed when a pilot passes an actual flight check and shows that he has made at least three actual or simulated instrument approaches down to the 150-foot decision height in the preceding six months.

Under the new rules, general aviation pilots, including those engaged in air taxi operations, must be retested every six months to retain their Category II authorization. Such authorizations are limited to flights in specified types of planes, whether large (over 12,500 pounds) or small. However, a pilot may be authorized to fly more than one type of plane under Category II approval if he passes a flight check and otherwise qualified in each one.

Regardless of the plane's weight or size, at least two qualified pilots must be in the cockpit during Category II landings.

Minimum experience requirements for Category II general aviation pilot applicants are: an instrument rating; 250 hours of cross-country flight, including 75 hours of instrument flight—50 of which must have been in actual instrument weather; and 50 hours of night flying.

Practical flight tests for both the initial qualification and for periodic renewals require pilots to demonstrate knowledge and proficiency in the use of Category II airborne equipment and in low approach piloting techniques. At least two simulated Category II ILS approaches to 100 feet must be flown using approved Category II airborne equipment. One of the approaches must be a discontinued (missed) approach.

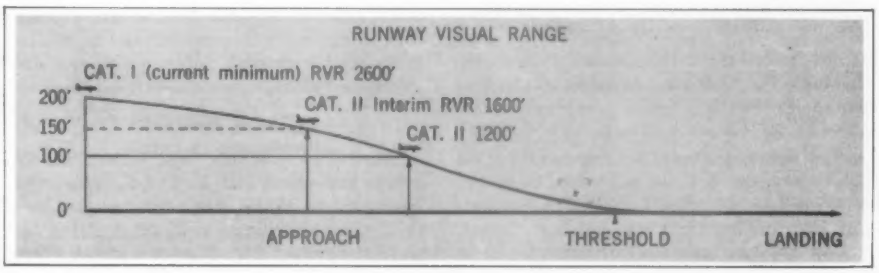
Besides pilot qualification, airplanes and airport runways must also meet special operating requirements for Category II landings. Basic airborne equipment required for Category II operations includes: a flight control guidance system consisting of either an automatic approach coupling mechanism or a flight director system with dual cockpit displays; rain removal equipment; and a radio altimeter for accurately identifying the 100-foot decision height, or a radio marker beacon receiver which provides pilots with both aural and visual signals when the plane is at 100 feet over the inner marker transmitter (approximately 1,200 feet from the end of the runway).

Complete details on maintenance and inspection requirements for the airborne equipment must be included in the FAA-approved Category II airplane manual.

Category II airports must have a standard approach lighting system with sequenced flashers, touchdown zone and runway centerline lighting, and high intensity runway edge lighting. Additional airport ground equipment includes two electronic RVR systems for measuring runway visual range (horizontal visibility), outer, middle and inner marker radio beacons, and instrument landing systems with improved signal accuracy and reliability.

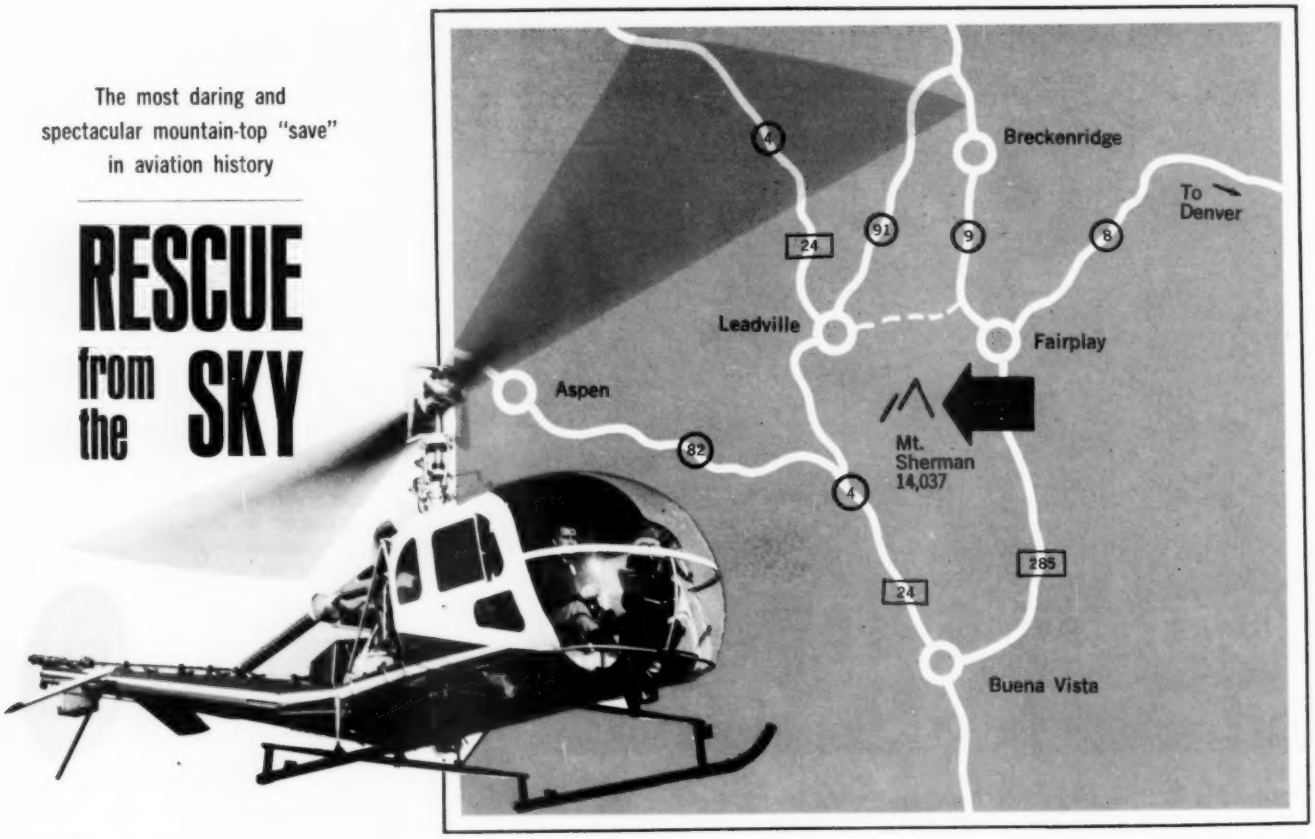
To date, 23 airports have been designated to receive Category II equipment. Most of them will be certified by FAA in 1967. Five airports — Dulles International, Oakland, Pittsburgh, Denver and New Orleans Moissant International—already have Category II equipment installed.

There are an estimated 150 general aviation planes equipped with FAA-approved Category II instrumentation. By 1969, the number will grow to more than 500.



The most daring and spectacular mountain-top "save" in aviation history

RESCUE from the SKY



A few weeks ago Robert B. Greeno, 38, of Denver was given FAA's Award for Extraordinary Service. The gold medal, presented by Colorado's Governor John A. Love and FAA Regional Director Joseph H. Tibbets, makes Bob Greeno the first helicopter pilot to receive the nation's highest civilian award for heroism in aviation. The story behind the award makes him one of the most remarkable mountain rescue pilots in history.

The story began several months earlier, on the morning of January 4, when veteran pilot Jimmy Williamson, also of Denver, took off from Stapleton Airport in a twin-engine Cessna 310. On board and bound for a skiing vacation in Aspen, Colo., were Mr. and Mrs. Orville Rosengren of St. Charles, Ill., and their two sons, John and Charles.

Caught in Downdraft

Just before noon the aircraft entered the Leadville-Fairplay area, home of the highest mountains in the Rockies, with more than a dozen peaks towering over 14,000 feet.

As the four passengers were enjoying the fascinating view of the snow-capped range, at an altitude of 15,000 feet, pilot Williamson felt the tug of a vertical air current. An instant later the aircraft was caught in a severe downdraft. The pilot sensed immediately that he could not pull up in time. With his air-speed down to 110 mph he managed to bounce and skid the airplane along a snow-covered ridge until it slammed full tilt into what miraculously turned out to be a ten foot snowdrift.

The impact ripped off the wing-tanks and tore holes in the fuselage, but there was no fire. Mrs. Rosengren's arm was broken, and son Charles had a dislocated shoulder; the others were only bruised and shaken. So far they had been lucky.

But they were stuck on the shoulder of a mountain nearly three miles high, buried under snow, the blue tip of the tail section barely showing, the weather sub-zero. Fortunately the radio was usable.

Williamson sounded his "May Day" and tried to raise FAA's Air Route Traffic Control Center in Denver. His signal was also picked up by the crew of a United Air Lines DC-6 training flight, to whom Williamson reported his estimated position.

Radio Silenced

After five minutes the battery in the downed plane failed and the radio went dead. Fierce winds shrouded the mountain top with blowing snow. The afternoon waned, daylight faded all too quickly and five shivering persons settled down for a long wait—how long no one could guess.

They had no way of knowing that their approximate position was known. By tuning in FAA's direction-finding station at Kiowa, Colo., the United crew had been able to pinpoint the crash site on the upper peak of 14,031-foot Mt. Sherman. Alerted by the Denver Center, the Colorado State Patrol immediately organized a hunt by land and air, involving nearly a hundred men, snow tractors, spotter planes and Army rescue helicopters. Adverse weather turned the searchers back at nightfall.

Search Resumed

At dawn search parties set out again. By 8:00 a.m. the ground party on Mt. Sherman had reached the 13,500 foot level. They could see half a dozen light aircraft of the Civil Air Patrol circling the mountain. Ten minutes later the wreckage was spotted by pilot Wally Powell of Aspen. The crash site was less than 30 feet from the summit.

The stranded pilot and passengers had been able to survive the night by donning the heavy skiing apparel in their luggage and huddling in the Cessna cabin. Minus 30 degree temperature had coated the cabin walls with ice. But in the morning the sight

Left—Bob Greeno is congratulated after returning from his second mercy flight from 14,031 foot Mt. Sherman. Above—the continental divide of the Rocky Mountains near Aspen. Right—Greeno at the controls of his Hiller SL-4.

of spotter aircraft circling overhead cheered their spirits, and when Powell dipped his wings in sign of recognition, a happy ending to their adventure appeared in store for them.

Then their luck changed. High winds, with gusts up to 50 and 60 mph, again began blowing snow with such intensity that visibility dropped to zero in places. Sno-cat tractors spearheading the overland rescue effort had to slow down literally to a crawl. At the same time the chance rose that the downed airplane might be obliterated by drifting snow before it could be seen by climbers.

It was at this crucial moment that Bob Greeno came into the the story.

Greeno to the Rescue

Greeno, accompanied by "Olie" Larsen, was out inspecting power lines for the Colorado Public Service Company in a supercharged Hiller SL-4 (4-place) helicopter. En route to Glenwood Springs, near Aspen, Greeno picked up details about the crash over his radio. He learned that the downed pilot was his old friend, Williamson. He decided to take matters into his own hands.

The supercharged helicopter had a service ceiling of 22,000 feet, but a critical altitude of 13,000 feet—at which point appreciable power loss began. Greeno felt that he could compensate for the power loss by riding the updrafts on the windward side of the 14,000 range and staying away from the downdrafts on the leeward side. He knew that the slightest miscalculation on his part could spell disaster. He went in.

Handling the wild gusts with incredible skill, he was able to locate the downed plane near the mountain summit and land within 25 yards. He "landed" in theory only, for the wild blasts and the shifting snow underfoot made it necessary for him to use power to hold the helicopter in place, while Larsen helped the two older Rosengrens on board.

To lighten the lift-off load, Larsen remained behind. Taking off in the teeth of the wind, with the mountain obscured by blowing snow, Greeno calmly sailed off in the direction of Leadville, about eight miles distant. Eleven minutes later he landed beside a waiting ambulance. Mr. and Mrs. Rosengren were soon resting comfortably in the Leadville hospital.

Crucial Decision

It was now 9:15 a.m. At the site of the crash, where the ground rescue party had now arrived, the weather had been worsening steadily. A real "ground blizzard" was taking place, with gusts over 90 mph. It was impossible to expect the helicopter to return for another pickup, and Larsen started down the mountain with some of the the others on snowshoes. However, the main ground team decided to wait. The benumbed survivors were in poor condition to stand the hours-long trek down the mountain. If by some miracle Greeno did return. . .

The Return of Greeno

He did come back!

Bucking the gale, it took him 40 minutes to reach the mountain top. But by this time the winds were howling around the peak with such ferocity that he was unable to bring his craft down, and soon he disappeared from the view of the ground team.

Moments later, however, they received word via radio that he was down on a slope about a thousand feet below the crash site. Soon the searchers were able to discern the red flasher on his helicopter and hear the wail of his siren. They brought the three remaining survivors aboard. Several men had to throw their weight on the heilcopter, which was fluttering like a leaf, before it could be boarded.

With the heavier passenger load and the winds howling and spitting snow in all directions, Greeno decided against attempting a vertical take-off. Maneuvering the helicopter delicately along the slope until he reached the brink of a steep canyon, he effected a "drop-off" departure into the canyon, gained airspeed and pulled away from the invisible mountain. Minutes later he delivered his passengers to the same waiting ambulance in Leadville. Some 20 hours had elapsed since the crash.

Seconds to Spare

There were no more return flights to Mt. Sherman. Talking about it later, the modest Greeno admitted that he had taken off with only seconds to spare on that last flight, as visibility was closing down completely. The five persons he rescued, who all recovered from their ordeal with no ill effects, will always be grateful for his courage and skill.

Behind that amazing performance lies over 5000 hours of helicopter time. Bob Greeno began logging helicopter experience in the Korean War as an Army rescue pilot. As an aerial power line inspector he has come to know the Rockies well and has made many rescue flights over them. A quiet family man who lives with his wife and four children in Broomfield, a suburb of Denver, Greeno looks on his helicopter flying exploits as all in a day's work.

On that snowy wind-blown ridge on Colorado's Mt. Sherman, he put in a few extra hours.

—Lewis Gelfan

Pre-flighting the pilot for those long hot days...

summer flying

Summertime is flying time. The weather is fine, vacations are in style and the urge is on us to sail away on aluminum wings. Well, why not?

Airplanes were never better or safer. Most of today's pilots are a cool, well-trained breed of airmen who realize that man was originally designed to walk on *terra firma*, and that the urge to fly came later. As a consequence, those who pursue the realm of flight require an understanding of its special environment. Summertime is one special kind of environment that can create problems for the aviator.

Not the least of these is the natural tendency of vacationers to over-eat, over-drink and under-sleep. Over-indulgence should be slept off *before* a flight—not in the cockpit. Autopilots were not intended for this purpose.

Heavy eating prior to flight can make a pilot sluggish and inattentive to his chores. If indigestion develops, there will be more discomfort at altitude. For a flight of four hours, for example, there is no need to eat so heavily so that you won't be "dying of hunger" before you arrive at your destination. It is quite impossible to starve in four hours, or even twice four hours. Indeed, a light, easily digestible meal, supported by inflight snacks such as crackers, mints or other hard candy, will make for sharper, more alert piloting.

Apples, because of their moisture content and firmness, also make excellent cockpit snacks. Not recommended are candy bars, which tend to melt into an unmanageable mess; and fresh fruits such as bananas or oranges, which must be peeled. These distract the pilot's attention. Also on the not-recommended list are "filled" foods such as pies, which are hard to manage at the dinner table even with two hands free, let alone in a bobbing aircraft.

Beware the "funny" Taste

Summer pilots should avoid partaking of raw shellfish, cream and custard pastries, or baked goods prepared with frozen eggs, because of possible contamination. Bacterial food poisoning may

Five Rules to Remember
For Safe Summer Flying

1. Six to eight hours of flying time is a normal limit. Don't stretch it.
2. To fly like a bird, eat like a bird—lightly and often.
3. Carry salt tablets (and drinking water) in the cockpit.
4. Land at the first sign of drowsiness, dizziness, or nausea. You may not have a second warning.
5. Tired eyes mean a tired pilot. Sleep it off, on the ground.

occur rapidly in such foods when exposed to heat. Some spoiled foods give no indication, by odor, color or taste, of their potentially poisonous state.

Don't eat at questionable places before a flight. If anything served you tastes "funny," refuse it—the consequences might not be so funny later in the air. The onset of food poisoning can be so abrupt that there is no previous warning; and it can incapacitate you completely.

The summer pilot almost invariably comes up against the question of how long should he wait, after drinking alcoholic beverages, before climbing back into the cockpit. The standard airline rule is 24 hours "from bottle to throttle"—including beer drinking. If you think you can fly on a narrower margin of safety, you may be in for a surprise. "Hangover" effects may appear long after the euphoria is gone, resulting in an impairment of flying ability which the pilot himself may not recognize.

Certain medications prescribed by doctors or sold over the counter for the treatment of hay fever should be avoided by active pilots. The antihistamine ingredient in these preparations can induce drowsiness in flight. To be on the safe side, when taking any medication at all inform your aviation medical examiner and ask him about the flight implications. It is always a good idea to let your family physician know that you are a pilot, so that he can take this into consideration when prescribing any medical treatment.

Alcohol exaggerates the effect of antihistamines and should never be taken when under this type of medication.

Summertime is the season of thirst. An active person out in the sun will lose several quarts of water a day through perspiration, exhalation, etc. The liquid is easily replaced, but the loss of body salt is normally made up only through the intake of food. An abrupt loss of salt can have serious consequences unless a person realizes what has happened. A sharp lowering of the salt balance in the body can cause physical weakness, nausea, and eventually fainting. Salt depletion is also associated with cramps and other muscular spasms

Guard Against Salt Loss

Salt can be replaced by taking two or three salt tablets a day when out in the sun in very hot weather. The tablets are available in drug and grocery stores. Salt intake can also be stepped up by adding more bacon or ham to the diet, as well as salted nuts, potato chips, etc.

Swimming, incidentally, does not cause perspiration but it does involve loss of body water, and with it salt. Swimming in the sea does not automatically restore lost salt either.

Neither heat exhaustion nor sunstroke are likely to occur in flight, so long as there is adequate cabin ventilation. Either condition may occur on the ground, while the pilot is waiting around in a bright sun to have his plane serviced; a good hat or cap will usually protect the pilot. Nausea or dizziness are symptoms common to both ailments, and should not be ignored.

If the symptoms occur in flight, land as soon as possible; if on the ground, seek shade and relax. Recovery involves prolonged rest. A cold shower may provide temporary relief, but has no lasting effect; the symptoms could quickly reappear if flight is resumed.

Sleep is Great Restorer

The long summer days may tempt one to crowd too many hours of play and flight into a single day. Fun on the beach and on a mountain top is an ideal preparation for sleep. Attempting to fly on to another stopover, instead, will invite fatigue and stress, which lowers piloting skill markedly.

A personal pre-flight physical, before taking off, is a good idea. "If you can *feel* your eyes when they move, as you look around, you are on the threshold of dangerous fatigue," Dr. Stanley R. Mohler, of FAA's Office of Aviation Medicine, advises. "By the time you are airborne, you can expect an almost uncontrollable urge to close the eyes, for only a second, to catnap. You are in no condition to be flying."

Another "eye clue" to approaching dangerous fatigue is a noticeable lag in the time it takes to refocus the eyes on the instrument panel after gazing at the horizon. As the condition worsens, there is a likelihood of making mistakes in reading the instrument dials and in making computations.

How long is too long in the air? With a fresh start, six hours is a fair day's flying. However, a completely rested person can fly up to eight hours without experiencing heavy fatigue. Good physical condition helps. The pilot with a trim waist line and a habit of daily exercise will be alert at the controls long after a sedentary type starts to nod in his seat.

Summertime is flying time—man your planes and head north with the sun. But remember the lesson of Icarus, the first reported pilot casualty in historic time, who flew too high too long and had his wings singed by the golden orb.

Van Nuys Tries Harder

because it is second busiest

Good pilot-controller relationship is key to safe, fast operations at this California general aviation terminus

Parallel runways make possible simultaneous operations at Van Nuys Airport, Western hub of light plane flying.

How to succeed as an airport in an area where land is valued at $65,000 an acre and where there are more people living and more private airplanes than any county in the country—that is the problem faced by Van Nuys Airport in southern California's San Fernando Valley.

Van Nuys is a suburb of Los Angeles, whose 10 million plus population spills over the Santa Monica Mountains into the San Fernando Valley. The mountains tend to push the smog back toward the sea, leaving the "Valley" with good visibility nearly every day of the year; about 96 days out of 100 are VFR. As many as 300 airplanes manage to fly in or out of the airport during a single busy hour.

Over the past five years Van Nuys Airport has been ranked either first or second nationally in terms of general aviation operations. In 1966, in second place behind Opa Locka, Fla., Van Nuys Tower recorded 534,331 operations.

Jamming this kind of traffic volume into a 700 acre airport, with one 8,000 foot runway and one 4,000 foot parallel runway only 300 feet apart, with no radar and no ILS—this is part of the problem at Van Nuys. Expanding the airfield is made difficult by the high cost of land. The San Fernando Valley was not the site of the '49 gold strike, but it could well have been, in the light of the current astronomical land values.

300 Operations an Hour

During an average day at Van Nuys Airport the tower logs 1500 operations. This total has gone as high as 2500 on holidays and special occasions; 300 operations an hour during heavy peak hours is not uncommon.

Nor is it unusual to see 18 or 20 aircraft in the patterns at one time, jets and turboprops mixed in with Cubs. Over 660 aircraft are based on the field.

The reasons for this heavy traffic at Van Nuys are many. For one, California leads the nation in the number of privately registered aircraft by far—12,936 to second place Texas' 7819 in 1966. For another, Van Nuys Airport is only 30 minutes driving time from Los Angeles Civic Center, and only 20 minutes from Hollywood or Beverly Hills.

As a center for instructional flying, Van Nuys Airport has been the favorite airfield of many thousands of southern Californians, including a goodly number of Hollywood screen stars. In its early history, in the 1930s, Van Nuys Airport was the scene of many famous aviation movies, and something of the glamor of those helmet-and-goggle days continues to hang over the airport.

Six Flying Schools

Today there are no less than six flying schools at Van Nuys, with 50 full-time and 100 part-time qualified flying instructors. Nearly *90,000 hours* of flying instruction were given during 1966. During this year FAA's Van Nuys General Aviation District Office (GADO) processed 2,334 aviation certificates and ratings.

All of this sounds like good business. But the sobering fact is that instructional flying does not provide enough income to keep an airport like Van Nuys, with its expensive real estate, in the black. Yearly interest on airport bonds accounts for 41.3% of the budget. The largest single expenditure of the airport (apart from bond interest) goes for airfield maintenance—over $100,000 in 1966. With the traditional absence of landing fees, the half million-plus operations provide no compensating revenue. The basic income (over 60% of total revenue) comes from the leasing of ground and plant facilities.

Throughout most of its history the airport has paid its own way. It began life in 1928 as an 80 acre patch of farmland, operated as a private airfield. By the time World War II came along it had expanded to 500 acres and was used for military operations. At the close of that war it was turned over to the City of Los Angeles for $1 with a provision made for basing a California

Newly erected 60 foot FAA tower awaits only installation of electronic gear. Bright display radar will help speed traffic flow.

Eighteen to 20 aircraft in the pattern is a common sight at Van Nuys Airport. Tower has frequently handled over 300 operations an hour.

A long way up on foot to cab of old metal tower.

Air National Guard unit until 1985. Some 200 additional acres have since been acquired. Traffic began booming in 1960 and continued to set records year after year; but revenues fell behind expenditures.

The Los Angeles Department of Airports, which operates both Los Angeles International and Van Nuys Airports, has sought to improve the situation at Van Nuys by attracting big business interests to the airport. The seven fixed base operators have been encouraged to expand their sales and rental activities. Several hundred thousand dollars of city money has been spent for such conveniences as a "visitor center" and flight lounge. Business jets are becoming a common sight on the field. An ultra modern four story office building has recently been completed at the south end of the field, with the motto, "Walk in, fly out."

With excellent helicopter service to downtown Los Angeles and nearby airports, Van Nuys may soon be passing into a new phase of activity as a base for big business operations, which may provide enough revenue to justify a more sophisticated runway configuration. In the meantime, the present heavy traffic must be handled with existing facilities.

FAA's air traffic control tower at Van Nuys is manned by 10 controllers and 3 supervisers, under the leadership of tower chief Bob Graner. The tower itself, an antiquated 15-year-old metal-girded structure, looks more like a water tank than a control tower, but it will soon be replaced by a modern 60 foot FAA tower adjacent to the main runway. But there is nothing antiquated about the operation of the present tower crew.

Simultaneous Landings

Despite the short 300 feet between runway centerlines, simultaneous landings and take-offs are handled at busy Van Nuys, with smaller aircraft using the 4000 foot runway and larger aircraft using the 8000 footer. Only with this maximum usage is it possible to handle as many as 300 aircraft an hour, and even then it can only be done because of the excellent rapport that exists between the air traffic controllers and the pilots who use the airfield regularly. With as many as eight or nine aircraft in the pattern at one time, the pilots know that radio transmissions must be extremely brief and to the point—or someone will have to miss his turn. Efficient use of the radio is the key to the remarkably swift, safe, high volume traffic operation at Van Nuys. Accidents are few and rarely involve injuries. No fatal accident has occurred on the airfield in the past 10 years.

In spite of the speed with which traffic is handled, some restrictions have already made their appearance at Van Nuys Airport. Pattern work is now prohibited between 9 p.m. and 7 a.m. No other restraints on instructional or practice flying are presently under consideration by the airport management, but the need for a reliever airport for Van Nuys is frequently expressed.

Until such relief arrives, the burden will remain on the shoulders of the air traffic controllers to keep the traffic moving and separated. With good pilot cooperation, Van Nuys will continued to be the western Mecca of general aviation.

Van Nuys Vital Statistics

Airfield: 700 acres, two parallel runways, 8,000 and 4,000 feet.
Air Traffic Facilities: FAA tower, no radar, no ILS.
Operations: Second ranking general aviation airport, 534,331 operations (1966).
Fixed Base Operators: Seven.

Aircraft Based Here:	Single-engine	504
	Multi-engine	117
	Rotorcraft	26
	Military	16
		663
Total Revenues (1966)		$697,612.00
Expenditures		$686,651.00

how to be a bird dog

The U.S. Army's light plane training course.

Part II of a series on Fort Rucker

A small airplane with conventional fixed landing gear, two-place tandem seating and a general air of belonging to a bygone day of aviation, swooped down and cleared a plastic rope barrier stretched between bamboo poles at one end of a paved runway. The airplane touched down hard and bounced back into the air as the student pilot gunned the engine.

"See that? That's what we like to see. We tell them, if it doesn't feel right, don't try to salvage it. Just keep going. We save a lot of aircraft from the junkpile that way."

The comments came from training officers of the U. S. Army's Aviation School (Department of Fixed Wing Training) at Fort Rucker, Ala. They were observing student pilots practicing short field take-offs and landings under the guidance of veteran civilian instructors.

The aircraft were O-1 *Bird Dogs*, military version of the Cessna 170, used by the Army for artillery spotting and surveillance in Viet Nam. The practicing students were expected to skim closely over the plastic line, marked with brightly colored pennants, and land their aircraft with a minimum roll. The available landing roll distance was gradually lessened, as the pilots' skill improved. Occasionally a plane came in too close and snapped the line—with no harm to the airplane. But in the jungles of Southeast Asia, the bamboo and other jungle growth is not quite so forgiving, so the practice goes on for many hours.

A cousin to the Cessna 170, *Bird Dog* is fitted with a 213 hp engine and a high lift wing. With a maximum speed of less than 100 mph, it is no speedster. Its endearing qualities are a low stall speed (40 mph with full flaps) and a high endurance; the normal cruise range is about 5.5 hours with 30 minutes of reserve. Empty weight is 1618 lbs.; maximum gross weight is 2400 lbs. Overall length is 25'10"; wingspan is 36'.

Learning to fly the *Bird Dog*, military style, comes in the final phase of the Army's pilot training program, which consists of 16 weeks of primary training at Fort Stewart, Ga., and 16 weeks at Fort Rucker. The pilot training program is open to two types of students: Army officers on active duty, and enlisted men. The enlisted men who are accepted for the program are designated as warrant officer candidates. To qualify for the warrant officer program you must be between 18 and 30 years of age, a high school graduate and a U. S. citizen; you must be between 5'4" and 6'4" tall and not weigh over 200 lbs. You must be able to pass a flight physical examination more stringent than the ordinary Army physical, one which stresses good eyesight and coordination.

Enlistment Program

Men who are accepted for the warrant officer pilot training program enlist for two years and agree to serve for a minimum of 36 months after completion of their flight training. Those who complete the course receive a single engine/multi-engine certificate with an instrument rating. It is a flight education which would cost the civilian many thousands of dollars to duplicate, and the Army has no recruiting problems in this field.

After the customary eight weeks of basic training, the warrant officer candidates enroll in a four-week pre-flight course at Fort

Editor's note: The statement regarding Army responsibility for helicopter and light plane activity in Viet Nam, which appeared in Part I of this series, does not apply to aircraft used in tactical air support. This is an Air Force responsibility. A forthcoming article will enlarge on this subject.

Left: student mechanics learn the nuts and bolts of the O-1 "Bird Dog," slow speed, tandem seating spotter aircraft used by U.S. Army in Viet Nam for artillery support. Right: Army light plane pilots learn instrument flying in T-42A, military version of twin-engine Baron Beechcraft. Below: Army student pilots learn short field landing technique by skimming down over tether line. Available runway is shortened progressively to less than 1,000 feet.

Wolters, Tex. The next stop is the primary training school at Fort Stewart, Ga., where flight training (and flight pay) begins, for warrant officer candidates and officers alike.

The aircraft used in primary Army flight training is a modified Cessna 172, known as the T-41B. Instructors are mainly civilians, experienced and patient. Training is thorough, and no student graduates until he is a complete master of his aircraft.

When the student moves on to advanced training at Fort Rucker, he moves up to a twin Beech *Baron*, in which he earns both his multi-engine rating and his instrument rating. Light twins are used extensively by the Army in Viet Nam for utility hauling.

In their final training phase, the Army aviators learn to feel at home in the *Bird Dog*, the aircraft most of them will be flying in Viet Nam. War-seasoned Army instructors take over their training and prepare them for the experience of flying over enemy territory.

The task of the *Bird Dog* spotter pilot in Viet Nam is to patrol a specific area day after day, seven days a week, observing the terrain closely and making notes of what he sees. Any change in the appearance of the landscape, however small, is noted down. Wheel tracks in the jungle muck, wisps of smoke, the glint of metal—all these call for close scrutiny and reporting. The Army light plane pilot must be capable of flying at tree-top level when necessary, and he must have *nerves of steel*, for an unfriendly gun may be hidden in any tree.

As a rule, enemy gunners do not fire on the *Bird Dogs*, for fear of giving away well-hidden positions. But the rule is occasionally broken. The *Bird Dogs* are usually armed only with smoke rockets for marking targets. The pilot is sometimes alone in his aircraft, but more often is accompanied by a South Viet Namese observer who knows the area. The value of pilots' services to the Army is indicated by the numbers of newly trained ones who are being turned out at Fort Rucker—an average of 50 per month.

Army usage of light planes for artillery spotting originated in World War II. Today seven branches of the Army are served by the Army's own pilots: infantry, armored units, signal corps, medical corps, engineers and transportation units—as well as the artillery.

In addition to becoming familiar with the FAA air traffic control system in this country, the Army pilots are taught ICAO (International Civil Aviation Organization) standards and procedures, so that they are capable of flying safely anywhere in the free world. They also have the satisfaction of knowing that they are using their piloting skill to maintain and extend the boundaries of freedom.

The Army's U-21A, similar to the civilian **King Air,** is a twin turboprop, serves as troop or cargo carrier.

Third of a series

Clyde Cessna

The man who gave wings to the prairie

Latest Cessna A-37 twin jet can hit 467 mph, has 1,200-mile range.

Wings began to sprout on the Kansas prairie back in 1916, when Clyde V. Cessna was given free loft space in the Wichita automobile manufacturing plant of a friend, who hoped that the novelty of an airplane being built on the premises would attract customers for his car—The *Jones Six*. Cessna repaid the favor by also naming his plane, a sleek, single-place, midwing monplane, the *Jones Six*. Neither has survived.

Clyde Cessna was actually an old hand at designing and building airplanes long before he set up shop in Wichita. In 1911, at age 31, he was already a successful automobile agency owner with a reputation as a natural-born mechanic. He was attracted to airplanes by the "Moisant International Aviators" troupe which visited Oklahoma City on Feb. 11, 1911.

Cessna promptly mail-ordered a Bleriot fuselage, improved it and began building his own craft.

On May 11, he was ready for a test flight. The tiny 4-cylinder, water-cooled, 60 hp engine coughed into hesitant life and Clyde was off . . . 10 feet . . . 100 feet . . . he started a turn—crash! Hasty repairs, up in the air again, turn—crash.

Three months later, after 13 tries, numerous crashes and two weeks in a hospital from injuries, Clyde Cessna had an airplane that he could maneuver without losing control.

From then on he was lost to the automobile industry. He built a new plane a year, constantly seeking superior designs. He also carved out a career on the barnstorming circuit as a skilled pilot, designer and showman. But when America entered World War I in 1917, Cessna folded his wings, returned to the family farm in Rago, Kans., and went back to the business of raising food. Apparently he was through with airplanes.

Wichita continued to attract aircraft builders. Walter Beech, E. M. Laird, and Lloyd Stearman, taking up where Cessna had left off, were building a new industry on the prairie.

In 1926 Beech and Stearman induced Clyde Cessna to forsake his farm and become president of their newly formed Travel Air Company. In its first year Travel Air sold 19 biplanes—a rather good beginning.

Cessna soon grew impatient for new frontiers to conquer. In 1927 he sold his interest in Travel Air to Beech and in December of that year Cessna Aircraft Company assumed its present name.

As business picked up, Cessna Aircraft expanded and in 1929 acquired an 80-acre plant site. Cessna began to acquire a reputation for economy with his four- and six-place airplanes. More than 20 aircraft companies were now competing in Wichita. But by 1930 the Depression had shuttered most of them.

Cessna attempted to go on, in the face of plummeting stock prices. An effort to market gliders failed, and in 1931 the board of directors ordered production stopped.

But Clyde Cessna, aided by his son, Eldon, rented another shop and went on building airplanes, including the famous racer, the CR-3, the first retractable landing gear-equipped Cessna, which set a world speed record (242.35 mph) in 1933.

In 1934 a new board of directors asked Clyde Cessna to resume production. A nephew, Dwane Wallace, won many racing trophies for the company. Air show prize money, a few sales, and aircraft repair work enabled the company to meet payrolls. But aviation sales in the 30s were slow.

Cessna retired to his farm once more in 1936, this time for good. Dwane Wallace became president and held that post until 1964, when he became chairman of the board and chief executive officer. Delbert L. Roshkam became president, and holds that post today.

Clyde Cessna lived to see Wichita become the Mecca of American light aircraft makers, with the company he founded towering over all the others in unit sales. With the aviation market stimulated by World War II, Cessna Aircraft concentrated on producing a "family type" of airplane which found widespread favor across the land. When Cessna died in 1954, his name was already a household word in air-minded America.

Cessna sales have accounted for half of the general aviation airplanes sold in recent years. Six months' earnings for the period ending March 31, 1967, were $5,563,000 out of sales of $105,327,000. Cessna Aircraft also has a $90 million-plus backlog of military aircraft and component orders.

The *Jones Six* is long forgotten as an automobile. But the factory site it shared with the first Wichita-built Cessna airplane may be remembered in history as the prairie cornerstone of the light plane industry.

—*Frank J. Clifford*

Cessna set speed record in this 1917 **Comet.**

BRIEFS

• THE MISSING LINK in air carrier planes between the DC-3 and short haul jets might be the Beechcraft 99, a 17-place, turbine twin scheduled for production early in 1968. The new plane has a 24 per cent greater capacity in ton-miles than the DC-3 and can operate at current air taxi fares of about 12 cents a mile and still make a profit with only three passengers, a Beech spokesman claimed. For use by scheduled airline and scheduled air taxi operators, the 99 is expected to cost between $350,000 to around $400,000, depending on equipment installed.

• MEDIUM INTENSITY RUNWAY LIGHTS, 100 times brighter than those currently in use at many small airports, will be recommended for financing under the Federal-aid Airport Program at all new installations at general aviation airports. At lest 50 per cent of the cost of the lights will be borne by the Federal Government. The medium intensity lights can be operated at a low setting during clear nights, using the maximum brightness for lowering weather conditions.

• DULLES INTERNATIONAL AIRPORT (Washington, D.C.) is no longer the only airport to have a mobile lounge. The manager of the Rockford (Ill.) Airport, Robert P. Selfridge, has converted a surplus Army bus to a comfortable, radio-equipped vehicle for conducting guided tours of the Rockford Airport to organized groups with an interest in aviation. For a total investment of $1,500 plus some voluntary labor, he has been able to acquaint more than 5,000 persons with the intricacies of airport management, control, tower procedures, aircraft maintenance and airport traffic flow. Touring space on the Rockford mobile lounge is booked up for months ahead.

• GENERAL AVIATION PLANE MAKERS can't complain about sales of their products abroad last year. During calendar year 1966, Aero Commander, Beech, Cessna, Lear Jet and Piper exported 2,903 aircraft with a manufacturers' net billing value of $75.4 million. Leaders in the market place were Cessna, with shipments of 1,594—value: $27.5 million; Piper, 936 planes–$17.6 million; and Beech, 267 planes—$18.9 million.

• CERTIFICATION FEES FOR AIRMEN and aircraft have been proposed by the Federal Aviation Administration. A basic $2 charge for written and practical examinations, plus other charges directly proportional to the service involved, would be assessed and would make it possible to modernize and update the currently over-burdened FAA airman registration system.

Rigid Rotor Helicopter Performs Loops, Slow Rolls With Ease

Lockheed put its aerobatic Model 286 helicopter through its paces during several demonstration flights early last May at Ft. Belvoir, Va., near Washington, D.C., before civil and military aviation officials.

The five-place craft, which has a speed of 205 mph and has been called the fastest in the world in its weight class, performed loops and eight-point slow rolls to demonstrate its complete controllability, stability and maneuverability.

The blades of the Lockheed 286 are rigidly attached to the rotor mast. This arrangement has always been considered as the ideal, but had always been regarded as unattainable because of the aerodynamic stresses on a rigidly mounted airfoil.

Most other helicopters have blades that are attached to the rotor mast with teetering or flapping hinges. Control and maneuverability is attained by allowing the rotor to tilt. Because of these teetering or flapping hinges, the gyroscopic action of the main rotor is far less effective in providing stability than a rigid rotor. Complex stabilization devices are sometimes required.

In the rigid-rotor helicopter, there are no teetering or flapping hinges. This gives the rigid-rotor 'copter a very high degree of gyroscopic stability along with maneuverability. This results in a smooth, swift and "live" response—similar to that of a light fixed wing plane.

Stick response is fast and crisp, far faster than conventional rotor systems. The pilot controls the rigid-rotor blades by means of a gyroscope mounted atop the rotor mast. This control gyroscope changes the pitch of the rotor blades—increasing their "bite" or lift to give direction to the aircraft (forward or back, to the left or right).

The model 286 is expected to have great military use in tactical support, escort, antisubmarine warfare, transport and rescue.

Lockheed's 200 mph rigid rotor helicopter, first of its type to be FAA certified.

airspeed indicators

To aviation historians, the question of which was invented earlier, the airspeed indicator or the airplane, is like asking whether the egg or the chicken came first. The Wright brothers had an airspeed indicator mounted on the wing strut of their first airplane, in 1903, but they had no idea of how fast they were whizzing over the sands of Kitty Hawk until after their flight was over.

The Wrights used a device known as an "air log," activated by a miniature wind-driven propeller. The tiny prop rotated a gear mechanism which recorded *total* revolutions in flight. Later on the ground they divided the revolutions by the elapsed time noted by a stopwatch and the result was their average airspeed.

Airspeed instruments with a panel read-out came into general use in World War I. A wind-driven propeller mounted in the airstream drove a flexible cable connected to an instrument case in the cockpit.

The modern diaphragm-type of airspeed indicator in use today was a development of the '20's, when the world was leaping into the air from almost every flat, open space that could accommodate the barnstormers who roamed the country. Acrobatic flight required a more accurate instrument; at low level flight the pilot's life often hung on a very slender margin of airspeed variation.

The modern instrument is a specialized air pressure gauge designed to measure the difference between *ram* air pressure and *static* or atmospheric pressure at flight level. The key components are a thin metal diaphragm, sensitive to pressure changes, mounted in a sealed case secured to the instrument panel; a pitot line and a static line.

The pitot line is connected to one side of the diaphragm; the static line, to the sealed instrument case. Through appropriate linkage, the force generated by the ram air from the pitot tube enters and expands the bellows of the diaphragm. At the same time the static tube, connected to the instrument case, acts as a neutralizer of the static pressure around the airplane and within the instrument. In this way, only the *dynamic*, or ram air is measured.

As the aircraft moves through the air, accelerating or decelerating, expansion and contraction of the diaphragm moves the indicator needle by means of gears and levers which translates air pressure into miles per hour or knots.

Placement of the pitot tube and static ports are of great importance. The pitot tube must be mounted so as to receive air free from aerodynamic turbulence. It is usually located in a forward position on the wing or the fuselage on the left hand side.

Static ports are placed at the point on the aircraft where the most accurate measurement of the actual outside air static pressure can be taken. This is determined by wind tunnel and flight tests. A favorite spot is the side of the fuselage, between wing and stabilizer.

The modern instrument is extremely rugged, as well as accurate. In almost every case, malfunction of the airspeed indicator may be traced to the pitot system. Water in the pitot tube causes the airspeed indicator to surge and give erratic readings. A partial obstruction in the line will result in a slower-than-actual reading. Malfunction can also be due to cracked or kinked lines, or misalignment of the tube or mast.

How can the pilot determine if he is getting a faulty reading inflght? The simplest test is a controlled stall. If the stall speed varies appreciably from the specified stalling speed of the aircraft, there is a strong chance that the instrument is out of order.

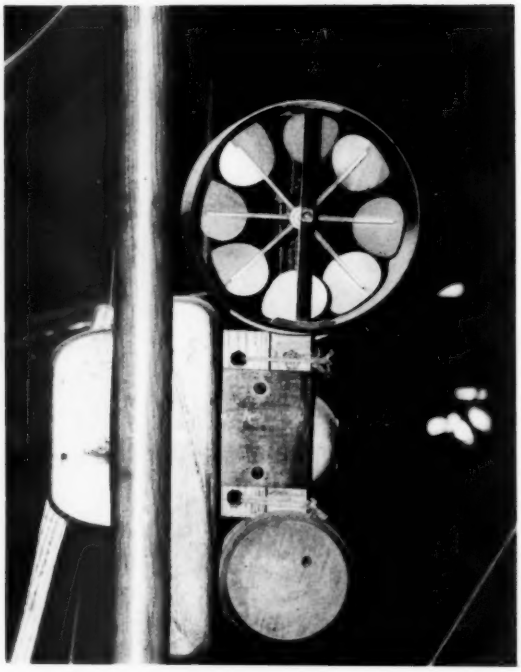
If you are getting no reading at all, the first thing to check on the ground is the pitot tube cover. If it has not been removed there will be a malfunctioning of the altimeter and rate of climb indicator as well as the airspeed indicator. If you have a pitot tube cover, it is a good idea to get into the habit of pocketing it during your pre-flight check.

The commonest cause of airspeed indicator errors is the easiest to cure—dirt or moisture in the pitot tube or line. Be careful in clearing this dirt. Blowing into the pitot tube may damage the air speed indicator. Application of air under pressure can destroy it.

A mechanic, after disconnecting the instruments, will purge the system using procedures and equipment specifically designed for the purpose. External cleansing of the pitot tube and static air ports can be done by pilots who have a pipe cleaner or toothpick handy. It is a simple matter to learn how to drain the line of accumulated moisture, using the valve provided for this purpose.

With regular routine care and inspection of the pitot/static system, the airspeed indicator should give many hours of trouble-free service. Remember that cold, wet weather (when ice may form in the lines) and muddy airfields are prime enemies of the well-functioning airspeed indicator. It is reassuring to know that troubles in the system can frequently be spotted with the naked eye. In fact, an intelligent inquisitive eye is often the tool you need to keep that vital instrument functioning perfectly.

Airspeed indicator technology has come a long way from the 1908 "air log" mounted on the strut of the Wright brothers' first aircraft. The original instrument is displayed in the Smithsonian Institution in Washington, D. C. Below: The modern instrument.



FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• VFR to Canada?

Is it permissible to fly from Detroit to Buffalo non-stop across Canadian territory on a VFR flight? If so, what is the procedure for such a clearance or under what circumstances is this possible?

Naperville, Ill.

You may fly VFR from Detroit to Buffalo. While flying over Canadian territory, flight must be in accordance with Canadian Rules of the Air, a copy of which may be obtained from the Queen's Printer and Controller of Stationery, Ottawa, Canada.

The FAA operates a flight service station in the Detroit area and personnel of that station will be glad to discuss the matter. The office is located in the Executive Terminal, Detroit Metropolitan Airport, Inkster, Mich. Phone: Area code 313-226-6000.

• Story With a Bouncy Ending

(Editor's note: The December, 1966 ***Aviation News*** *featured the story of the first trans-Atlantic round-trip, made by showman Harry Richman and pilot Dick Merrill in 1936. Richman had filled the wings with 50,000 ping pong balls to give the aircraft buoyancy in case they were forced to land at sea. What happened to the 50,000 balls when the flight was over? Mr. Richman provided* ***Aviation News*** *with the sequel.)*

When we returned to Floyd Bennett Field, Amelia Earhart greeted us; she was leaving in a few days for her ill-fated trip. I pleaded with her to take the ping pong balls, explaining their flotation power. Unfortunately, she refused. Had she taken them, I'm certain we would have found her plane.

So, I stored them in huge cartons in my Florida home.

Years later, in World War II, a man with the unusual name of Sailing Baruch (younger brother of Bernard Baruch) was searching for ping pong balls for the 100,000 servicemen stationed around Miami. He showed me just *six*, all he had found in three days of intense footwork and phoning. I took him into my storage room and opened one of the cartons (each carton held 10,000 balls). "Ye gods," he cried. "I didn't know there were that many ping pong balls in the entire world."

He rushed to call the general commanding the Army Air Corps in Florida. The news wires got wind of the story and newspapers throughout the country printed the enclosed photo. Shortly afterward, sacks of mail started arriving from military bases asking for ping pong balls.

I found out the rarity of the balls was due to the fact that the cellulose used in making celluloid ping pong balls was being used to make munitions.

After all those years in storage, many of the balls were dead. Six sergeants came to my house every day for two weeks to weed out the lively balls. These were mailed to American servicemen worldwide.

I was left with 10,000 dead balls. I then received letters from jails asking for ping pong balls for prisoner recreation. To my amazement, they wrote that dead balls were preferable to live ones because most of the players were dubs and the dead balls were easier to play with.

I'm certain not one of the soldiers or prisoners who played with those balls knew where they had come from, what they had gone through and where they had been.

I now have three left. Some day they will be auctioned off with the log of our flight. Yet I'm certain these balls never will bring the great pleasure and happiness to the buyers that the 50,000 others brought to millions of soldiers and sailors during WW II, and to the convicts in penitentiaries through the U.S.

Harry Richman
Hollywood, California

• Flares and Stalls

In the May *Aviation News* your article, titled "Landing," says: ". . . an aircraft which flares at 15 to 20 feet above the ground will hit the runway like a ton of bricks . . ."

Should the word have been "stall" instead of "flare"? Hope so.

Alfred Keplinger
Guilford, Conn.

The word should have been "stalls."

• Parts Manufacturing Approval

My question comes in three parts. (1) Is a person holding a parts manufacturing approval (PMA) required to submit a form 337 (Major Repair and Alteration—Airframe, Powerplant, Propeller or Appliance) when performing under his PMA?

(2) Is a person holding a supplemental type certificate (STC) required to submit a form 337 when modifying an aircraft under his STC?

(3) How can I be sure that material marked FAA-PMA is the genuine article?

Thousand Oaks, Calif.

As for (1), the answer is no. The answer to (2) is yes, if the modification is a major alteration. In the case of (3), we suggest that questionable cases be referred to your local FAA general aviation district office. Your closest GADO is located at Van Nuys Airport, 16700 Roscoe Blvd., Van Nuys, Calif. 91406.

Pertinent regulations are found in FAR 21; additional helpful information is in advisory circular AC 20-19A.

• Salute to Controllers

Recently when I was trying to land my Sky Master 1719Z at Ft. Lauderdale (Fla.) Airport, chaos was caused by: about two dozen VFR pilots jamming the frequencies for takeoff clearances to leave the field before the approaching storm closed it down; antennas blowing off the tower; an unattended Aero Commander with brakes unlocked rolling around the crowded parking area; and a couple of incoming jets being switched to other runways because I was in their way.

During all this confusion, I never detected a word of hurry, annoyance, or agitation in those calm, clear voices in the tower. It is extremely reassuring to hear cool, competent professionals bringing order to a situation that has everyone else losing their heads.

"Hats off to you boys and your training."

Detroit Pilot

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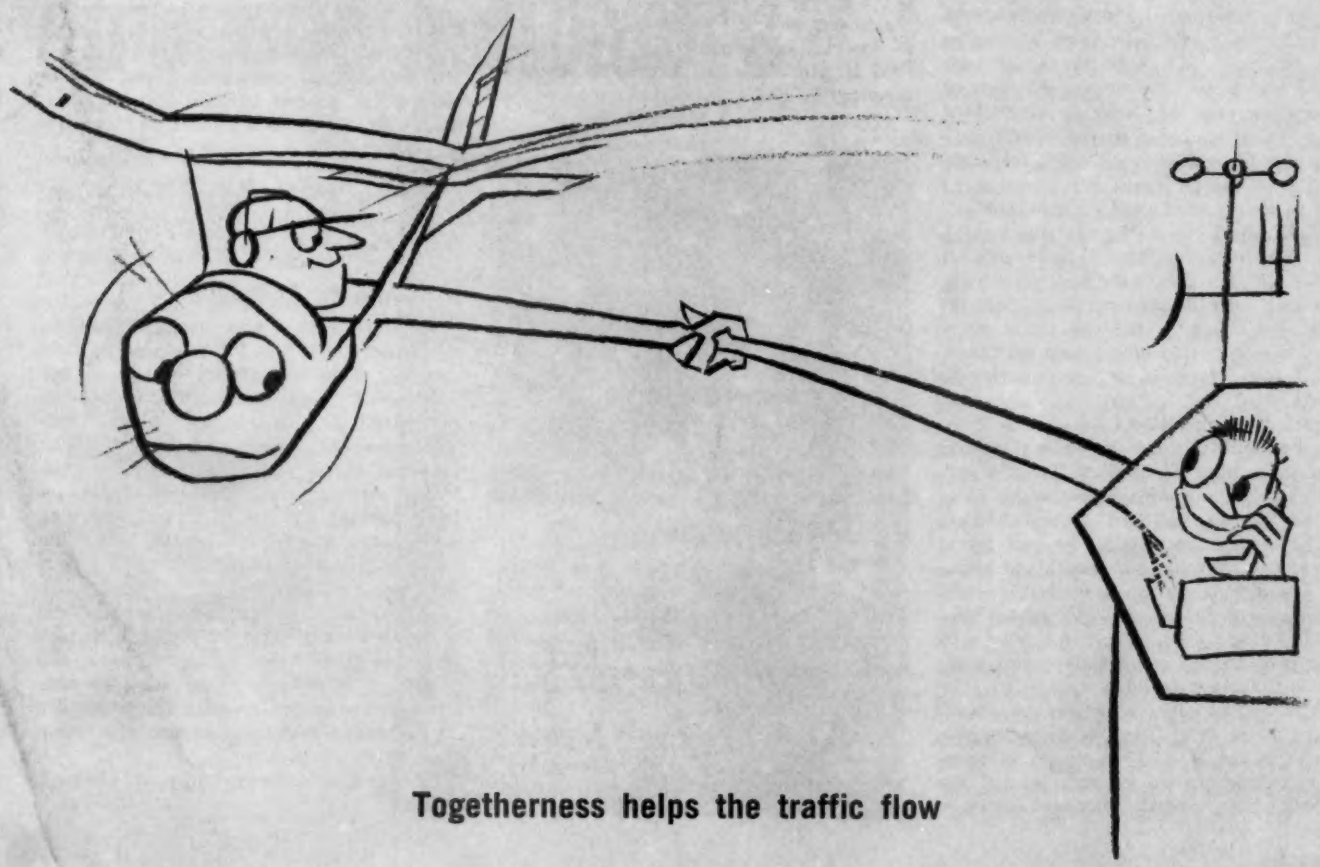

Togetherness helps the traffic flow